



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/537,167

06/01/2005

Shigeru Bando

1207-118

1070

23117

7590

02/06/2008

NIXON & VANDERHYE, PC

901 NORTH GLEBE ROAD, 11TH FLOOR

ARLINGTON, VA 22203

EXAMINER

MCMAHON, MARGUERITE J

ART UNIT

PAPER NUMBER

3747

MAIL DATE

DELIVERY MODE

02/06/2008

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

Application No.

10/537,167

Applicant(s)

BANDO, SHIGERU

Examiner

Marguerite J. McMahon

Art Unit

3747

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-5, 12, 18, 20, 23, 26-28, and 34 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☐ Claim(s) \_\_\_\_ is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____.  |

## **DETAILED ACTION**

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-5, 12, 27, and 28 are rejected under 35 U.S.C. 102(b) as being anticipated by Bando (5,265,565). Note a reciprocating engine comprising a first piston ring 3 adjacent to a top surface of a piston 2 defining a combustion chamber, a second piston ring 4, which defines an annular gas chamber in cooperation with said first piston ring and which is adjacent to said first piston ring such that a pressure-receiving area of a side surface of said piston in said annular gas chamber becomes greater on a thrust side than on a counter-thrust side, and a gas passage 41, 51, 11 disposed in an inner surface of a cylinder and which allows said annular gas chamber to communicate with said combustion chamber on the thrust side. See Figures 9-12 and column 9, last paragraph.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-5, 12, 18, 20, 23, and 26-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bando (5,265,565). Note a reciprocating engine comprising a first piston ring 3 adjacent to a top surface of a piston 2 defining a combustion chamber, a second piston ring 4, which defines an annular gas chamber in cooperation with said first piston ring and which is adjacent to said first piston ring such that a pressure-receiving area of a side surface of said piston in said annular gas chamber becomes greater on a thrust side than on a counter-thrust side, and a gas passage 41, 51, 11 disposed in an inner surface of a cylinder and which allows said annular gas chamber to communicate with said combustion chamber on the thrust side. See Figures 9-12 and column 9, last paragraph.

Bando shows everything except the recesses having the same size and shape (with respect to claims 18, 20, 26) or having a different size (with respect to claim 23) or the location of the recesses. It would have been an obvious matter of design choice to employ recesses having the same size and shape or having a different size since it has been held that the size of an element is generally recognized as being within the level of ordinary skill in the art. *In re Rose*, 105 USPQ 237 (CCPA 1955). In addition, the location of the recesses would have been an obvious matter of design choice, since it has been held that rearranging parts of an invention involves only routine skill in the art. *In re Japikse*, 86 USPQ 70.

***Response to Arguments***

Applicant's arguments filed 11/1/07 have been fully considered but they are not persuasive. Applicant argues that Bando does not suggest a plurality of gas passages which are disposed in an inner surface of the cylinder in such a manner as to be juxtaposed in a circumferential direction of the inner surface of the cylinder and which allows said annular gas chamber to communicate with the combustion chamber on the thrust side. Actually Bando does suggest just that. Please see column 9, last paragraph which states "Although the gas passage embodied by the concavity 41 may be disposed at any place in the inner surface 14 of the cylinder with respect to the circumferential direction thereof, it is preferable that it is disposed on the inner surface 21 of the cylinder facing to the thrust side of the piston 2 as in the present embodiment. Moreover, while the gas passage is embodied by the concavity 41 in the engine 40, it may be embodied instead by a through hole provided in the inner surface 14 of the cylinder. The number of such concavities or through holes as the gas passage may be one. **Alternatively, more than one concavity or hole may be provided in the inner surface 14 of the cylinder at positions shifted to each other with respect to the circumferential direction...**[emphasis added]."

Applicant further argues that Bando also does not teach that the plurality of gas passages comprise a first recessed portion which is disposed in such a manner as to oppose a center portion of said piston concerning a direction which is perpendicular to both the reciprocating direction of said piston and an axial direction of said piston when said piston is at a top dead center or during a starting period from the fall of the top

dead center, and a pair of second recessed portions, said first recessed portion being disposed between said pair of second recessed portions in said circumferential direction. Bando does show a first recessed portion which is disposed in such a manner as to oppose a center portion of said piston concerning a direction which is perpendicular to both the reciprocating direction of said piston and an axial direction of said piston when said piston is at a top dead center or during a starting period from the fall of the top dead center (see Figures 9 and 10 which show the recess 51 in the position described) and suggests that additional recesses may be employed, as noted above: **Alternatively, more than one concavity or hole may be provided in the inner surface 14 of the cylinder at positions shifted to each other with respect to the circumferential direction...**[emphasis added]." It would have been an obvious matter of design choice to select two additional recesses and to locate them on either side of the original recess, given Applicant's recognition of the desirability of providing additional recesses and the suggestion to provide them "at positions shifted to each other with respect to the circumferential direction.

### ***Conclusion***

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Marguerite J. McMahon whose telephone number is 571-272-4848. The examiner can normally be reached on Monday-Wednesday and Friday, 10am-6:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steve Cronin can be reached on 571-272-4536. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

  
Marguerite McMahon

Application/Control Number: 10/537,167  
Art Unit: 3747

Page 7

Primary Examiner  
Art Unit 3747